STEAM Science Lesson:

What's the Deal with Fossil Fuels? - Grades 6-8

Students will understand what fossil fuels are, and engage in a hands-on experiment to learn about the effects that extracting fossil fuels has on our environment. This lesson is designed for grades 6-8, but can be adapted for younger grade levels, too.

✅ **Teacher Led**	✅ **Requires Computer OR Mobile Device**	✅ **Requires Spaces**

Spaces Prep	**Create your Activity in Spaces before the lesson. Not sure how to create an Activity? Check out this short video tutorial on assigning and managing activities.**

Learning Goals

1. Students will **understand** what fossil fuels are and the common fossil fuels.
2. Students will **explain** the environmental impact of obtaining and using fossil fuels.
3. Students will **brainstorm solutions** for reducing the use of fossil fuels.

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Materials

Student Handouts	• **Fossil Fuels article from National Geographic** (shared electronically or printed for each student) • **Handout [A] - Mining Experiment** for each student (page 4-5) • **Handout [B] - Fossil Fuels Reflection** for each student (page 6)
Technology Requirements	• Mobile device, tablet, or laptop • Projector or Smartboard • Devices for each student (optional)
Video/Audio Clips	• What's the Deal With Fossil Fuels? video from California Academy of Sciences
Additional Materials	• Chart paper or white board • Markers or dry erase markers • Chocolate chip cookies (1 per student) • Plates (1 per student) • Toothpicks • Pencils

Instructions

Before the lesson

1. Start by asking students what they know about fossil fuels. Have the words “Fossil Fuels” written on a piece of chart paper or the white board. As students share their thinking, record their thoughts as web notes or bullet points.

2. Show the video What's the Deal With Fossil Fuels? video from California Academy of Sciences.

3. After, ask for any new learning or new opinions on fossil fuels based on the video. Record students’ ideas.

4. Have students read the Fossil Fuels article from National Geographic, either on individual devices or as hard-copy print-outs.

5. After reading, again ask for students' learning about fossil fuels and add their ideas to your recorded notes.

During the lesson

1. Explain that today, students will do an experiment to see how extracting fossil fuels from the earth impacts the environment. And, they get to use/eat cookies (eating comes after the experiment)!

2. Give each student a plate with a cookie and **Handout [A] - Mining Experiment** (page 4-5).

3. Have students complete the first side of **Handout [A] - Mining Experiment** (page 4). Encourage students to base their "environment" on a place they have been to and know well so that their information is as accurate as possible.

4. Hand students toothpicks, explaining that they are miners sent to extract coal from their cookie environment. Give students 5-7 minutes to use their toothpicks to extract as much "coal" (chocolate chips) from their environment as possible.

5. When the time is up, have students put their toothpicks down and leave their cookies as they are. Have them complete the second side of **Handout [A] - Mining Experiment** (page 5). Once they do, they can eat their cookie!

After the lesson

1. Give students **Handout [B] - Fossil Fuels Reflection** (page 6) and have them complete it. You may want to lead a discussion with the questions on the reflection or have students talk about the questions with a partner or small group before recording their thoughts.

Worksheet

HANDOUT [A]: Mining Experiment (side 1)

Name _____

Before Mining

Cookie *Draw what your cookie looks like*	**Environment** *Draw the imaginary environment of your cookie based on the questions below*

1. What type of ecosystem exists on your cookie (forest, desert, grasslands, etc.)? _____
2. What plants and animals live there? _____
3. How do humans exist there or use the ecosystem? _____

HANDOUT [A]: Mining Experiment (side 2)

Name _____

After Mining

Cookie *Draw what your cookie looks like now*	**Environment** *Draw what the imaginary environment looks like now*

1. How has the environment changed? _____
2. Is it possible to restore the environment to how it was before mining? _____
3. How might the plants and animals that were there be affected by the changes? What about the humans? _____

_____

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Worksheet

HANDOUT [B]: Fossil Fuels Reflection

Name(s) _____

Answer the following questions to reflect on your learning about fossil fuels.

Documenting in Spaces

> **Teacher Tip!** The instructions for this lesson involve adding to the Class or Individual Space in Spaces. You can adapt the instructions if you'd prefer to make this an Activity.

1. Students will document their learning in Spaces by following these guidelines:
    - Click **+ Create** > Choose **Camera** > Take a photo of **HANDOUT [A]: Mining Experiment** > Post Photo
    - Add a **Title** > Click the Title box and add a title to the Post.
    - Post a Description > In the **Post Description** box
    - Click ✔ **Next**
    - Choose the **Class Space** or **Individual Space**
    - Click ✔ **Post**
    - Add **Reflection** > Write a reflection answering the following questions:
        - What are the three main types of fossil fuels?
        - Based on your learning today, how do fossil fuels negatively impact the environment?
        - What possible argument(s) might be made in favor of continuing to use fossil fuels?
        - In response to these possible arguments, what is at least one solution you can think of to reduce the use of fossil fuels?
    - Click the **send arrow** to post your reflection.